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THE VALUE OF PASSENGER TRAVEL TIME:
Introduction and Selected Bibliography

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THE VALUE OF PASSENGER TRAVEL TIME:

INTRODUCTION AND SELECTED BIBLIOGRAPHY*

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The research articles listed in this bibliography are related to an understanding of how people choose their mode of transportation in cities. The problems associated with estimating travel time savings is an important determinant in the selection of which transport mode - car, bus, rail, rapid transit, bike, etc. - to use for the work trip. Travel time includes the walking, waiting, and en-route time encumbered by going from one point to another. All other variables held constant, an individual will select that mode which provides him with the shortest commute time. That is, every commuter tries to minimize his work trip time constrained by his income, the money costs of available transportation, comfort, convenience, and so forth.

Travel time has been separated into productive (production of goods and services) and unproductive (leisure) time. There are those who argue that travel time savings has no economic value, whereas others uphold its worth. The latter suggests that since the satisfaction of any desire has economic value, it must therefore follow that the desire to minimize travel time must also have such value. The opponents of this view advocate that since time inexplicably advances, value should only be assigned to the productive travel time saved. It is also argued that people would trade reduced income for additional leisure time or the reverse, depending on their personal values. A somewhat extreme view is that leisure time is a burden to people and to add to it through travel time savings benefits neither the individual nor society. People are not cognizant of the alternative uses to which they can put their leisure time. Others justify a value for leisure

time by viewing it as an element of production; the time spent in purchasing tickets is part of the total cost involved in seeing the show. Others have suggested that the small amounts of travel time savings accruing to an individual may not produce the same benefits as one large amount which could be more productively used. Further, the value of the travel time saved varies so much among individuals that only aggregate travel time reductions have value.

Several attempts through an income or cost approach have been made to assess how an individual values his travel time savings. Early attempts to measure the value of travel time savings through the income or wage rate approach assumed that an individual valued his travel time the same way he valued his time at work, that is, at his average hourly wage rate. This was rejected on the grounds that there was no suggestion that time spent at work and traveling to work could be considered equivalent. The more popular cost or choice approach employs user charges (toll bridge situations) to estimate travel time savings. A motorist probably selects a toll road as opposed to a free road if there is a travel time savings benefit. This savings is then equated to the toll charge to obtain the monetary value placed on commute time. The assumption of "rational man" and the failure to take into account the variable nature of travel time between individual situations detracted from the success of many of these studies.

Travel time savings is important to transportation policy making in estimating the user benefits accruing from highway improvements and in predicting mass transit usage. Since the 1920's travel time savings has been recognized as a scarce resource

which is purchased and utilized to satisfy human needs. It is an important input to decisions concerning highway improvements since it is used to evaluate the user benefits which accrue from highway improvements. Small changes in travel time estimates produce considerable change in the estimated rate of return from highway investment expenditures. Mohring, in attempting to estimate the value of travel time savings, suggested that highway authorities should maximize benefits by setting the price of a trip on each link of the network equal to its short run marginal costs and expanding or contracting each link so that the quasi-rents earned by the link were equated with its capital costs.

The choice between two modes of travel frequently involves a trade-off of time against money, i.e., one mode is cheaper but takes longer than the other mode. In this area, Moses and Williamson, using indifference curves, developed a model to predict peoples' choice of mode. Rates of substitution between working time, traveling time, and leisure time were calculated. Using the marginal wage rate to represent the value of time spent in traveling to work, they demonstrated that a fare reduction and service improvement in public transportation would not increase patronage. Their income-cost approach involved the wage rate, travel time, and the money cost of the mode available to the commuter. The time difference between the two modes was multiplied by the worker's marginal wage rate and from this was subtracted the additional cost of the faster mode. The diversion price revealed the price changes required to induce shifts from auto commuting to public transport. The study showed that negative prices would be

necessary on all modes of public transport to divert at least 50% of those making the work trip by car, i.e., a person would have to be given 50 cents to ride the bus. They concluded that the feasibility of significantly reducing auto congestion through reasonable price reductions in the cost of a public transit ride was slight.

Naturally, travel time savings is but one of the many variables that influence mode selection. Other factors such as comfort, privacy, ride quality and social image also enter into a commuter's utility function and influences his patronage of the various transport modes available to him. However, the following references attest to the fact that travel time savings and costs have and will receive considerable attention in the literature.

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